

BOTANY.—*Studies in Lonchocarpus and related genera, IV: The Lonchocarpus rugosus complex and additional Middle American species.*¹ FREDERICK J. HERMANN, U. S. Department of Agriculture.

In Part II of this study (Journ. Washington Acad. Sci. 38: 11–14. 1948) an attempt was made to dispose of the various species of *Lonchocarpus* described from Middle America since the publication in 1917 of Pittier's monograph of the species known from that area. Because of lack of herbarium material, however, 17 of these names could not at that time be taken into consideration. Specimens of 10 of these have subsequently become available, through the courtesy of Dr. C. L. Lundell and of the Chicago Natural History Museum, and the result of their study is presented herewith. Several of the names prove to be referable to the protean *L. rugosus* Benth., so a brief discussion of the variations exhibited by that species is appended.

Lonchocarpus apricus Lundell, *Lloydia* 2: 90. 1939 = *L. rugosus* Benth., Journ. Linn. Soc. 4: 92. 1860; Standley & Steyermark, *Fieldiana, Botany*, 24(5): 283–284. 1946.

It was not found possible to correlate with other characters the "numerous approximate lateral veins of the leaflets" by which *L. apricus* was originally set off from *L. rugosus* and *L. hintoni*, nor is this character constant or of geographical significance. Further "differences in pubescence flower size, number of ovules, and leaf form" ascribed to the plant were not detected except in so far as the cited material showed a somewhat more appressed pubescence than most of the collections from Campeche where Bentham's type originated. This, however, is clearly a tendency only and is apparently an ecologic response rather than the result of geographic factors.

Lonchocarpus belizensis Lundell, *Wrightia* 1: 55. 1945 = *L. luteomaculatus* Pittier, *Contr. U. S. Nat. Herb.* 20: 64. 1917.

Although the petals of *L. belizensis* are described in the original description merely as dark red, the standard shows a well-defined yellow area in the center. This and the large size of the standard indicate that the alliance of the plant is with *L. luteomaculatus* rather than with *L. latifolius*.

Pittier's key (*Contr. U. S. Nat. Herb.* 20: 51–52. 1917) does not satisfactorily separate *L. latifolius* from *L. luteomaculatus*. One of the few reliable differences between the two appears to be in the shape of the pods. In *L. latifolius* these are elliptic and pointed at both ends; in *L. luteomaculatus* they vary from almost circular to oblong with rounded ends. The length of the standard (6 mm in *L. latifolius*, 10 mm in *L. luteomaculatus*) also seems to be constant. *L. latifolius* frequently has a yellow-centered standard like that of *L. luteomaculatus* but when it does it is a less well-defined "spot" or area and shades off into the red background. The inflorescence in *L. latifolius* tends to be in the form of simple racemes in the upper leaf axils; in *L. luteomaculatus* the racemes are more often compound, or the upper internodes are so greatly shortened that the numerous racemes become crowded and appear to be fastigate and terminal or nearly so, and at times the inflorescence actually becomes a terminal panicle.

Lonchocarpus chiapensis Lundell, *Wrightia* 1: 152. 1946 = *L. peninsularis* (Donn. Smith) Pittier, *Contr. U. S. Nat. Herb.* 20: 56. 1917.

The specimen (*Inst. Fis. Geogr. Costa Rica 13966*) from which the characteristics of the fruit in Pittier's description of *L. peninsularis* were drawn (*Contr. U. S. Nat. Herb.* 20: 57. 1917) has ovate, 1-seeded pods only (and these, incidentally, are decidedly overripe, hence the "remarkably recurved carinal margin" which is consequently an infrequently seen condition). Plants with oblong, 2- and 3-seeded legumes are also common, and often both types are found in a single inflorescence as in the type of *L. chiapensis* (*Matuda 5008*). A similar situation obtains in *L. luteomaculatus*. The leaflets in *L. chiapensis* are conspicuously punctate, a characteristic omitted from the original description. In other respects, as well, the type collection closely matches authentic material of *L. peninsularis*.

Lonchocarpus cruentus Lundell, *Wrightia* 1: 55. 1945 = *L. sericeus* (Poir.) HBK. *Nov. Gen. & Sp.* 6: 383. 1823.

The type of *L. cruentus* has the nerves on the

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upper surfaces of some of the leaflets as strongly impressed as any to be found in *L. sericeus*. Truly impressed nerves in *L. sericeus*, however, are not the prevailing condition; only in unusual cases can they be said to be plainly impressed. The one difference detected between *L. cruentus* and the prevalent form of *L. sericeus* was in the calyx length of 2.5–4 mm, rather than 5 mm, but the form with shorter calyx not infrequently turns up elsewhere, as in Eggers 1432 from Trinidad (calyx 3 mm long).

Lonchocarpus gillyi Lundell, *Wrightia* 1: 56. 1945 = *L. rugosus* Benth., *Journ. Linn. Soc.* 4: 92. 1860.

Leaflet size appears to be an altogether unreliable diagnostic feature in *L. rugosus*. In the majority of instances they may be larger in that species than are those in the form proposed as *L. gillyi*, yet in some specimens of otherwise typical *L. rugosus* they are even smaller. The fact that the racemes are borne on the old wood in the type of *L. gillyi* is taxonomically meaningless. Among others *Matuda 4020*, referred by the author of *L. gillyi* to his *L. apricus*, likewise has the racemes borne on the old wood; and the type of *L. hidalgensis* Lundell has inflorescences on both the old and the new branches.

Lonchocarpus hidalgensis Lundell, *Wrightia* 1: 153. 1946 = *L. rugosus* Benth., *Journ. Linn. Soc.* 4: 92. 1860.

The purportedly distinguishing character of axillary racemes in *L. hidalgensis* is found also in *L. gillyi*; in the Chicago Natural History Museum sheet of *Lundell 857*, referred by its collector (Lloydia 2: 92. 1939) to typical *L. rugosus*, and in *Matuda 4525*, referred in the same paper to *L. apricus*. Other peculiarities characterizing *L. hidalgensis* represent variations too unstable to merit nomenclatorial recognition.

Lonchocarpus hintoni Sandwith, *Kew Bull. Misc. Inf.* 1936: 4. 1936 = *L. rugosus* var. *hintoni* (Sandwith) comb. nov.

This appears to be the only variant of *L. rugosus*, of the several recently proposed as specifically distinct, deserving of taxonomic status. So far as known, it is geographically segregated in the Mexican States of Michoacán, Guerrero, and México, and is distinguished from typical *L. rugosus* by the cinereous stri-

gosity of the leaves (except the upper surfaces of the leaflets which tend to be glabrous and shining at maturity) and inflorescence, this being especially pronounced on the pods which are firmer and more coriaceous than in other forms, and by flowering before the leaves expand. These characteristics are striking in their extreme form, particularly in flowering or fruiting specimens, but they show considerable variation and sterile material very often is decidedly intermediate.

The locality cited for the Langlassé collection (*No. 108*) in the original description of *L. hintoni* apparently is in southeastern Michoacán rather than in Guerrero.

Lonchocarpus nicaraguensis Lundell, *Wrightia* 1: 154. 1946 = *L. PENINSULARIS* (Donn. Smith) Pittier, *Contr. U. S. Nat. Herb.* 20: 56. 1917.

The nonimpressed nerves and the clearly punctate leaflets (the latter feature, however, not noted in the original description) of the type material of *L. nicaraguensis* may well have been the reason for its affinity having been surmised to be with *L. michelianus* rather than with *L. peninsularis*. The misplacement of the latter species in Pittier's key (*Contr. U. S. Nat. Herb.* 20: 51, where it is placed under section *Spongopteri* of series *Impressinervi* instead of under section *Punctati* of series *Planinervi*) was the apparent cause of the proposal of at least two other synonyms, *L. kerberi* Harms and *L. purpusii* Brandegee (cf. *Journ. Washington Acad. Sci.* 38: 13. 1948), of this common species.

Lonchocarpus phlebophyllus Standl. & Steyerl., *Field Mus. Publ. Bot.* 23(2): 56. 1944.

This appears to differ from *L. eriocarinalis* Micheli only in its apparently consistently 5-leaflets (rather than 7–11) with more numerous nerves. The vein-number has proved to be of negligible diagnostic value in the closely related *L. rugosus*, but it is possible that when flowering material of *L. phlebophyllus* has been collected additional characters may be found which could be correlated with the anomalous leaflet number.

Lonchocarpus whitei Lundell, *Wrightia* 1: 154. 1946 = *L. MINIMIFLORUS* Donn. Smith, *Bot. Gaz.* 44: 110. 1907.

In the publication of this name no affinity with other species was suggested, but the type

material (in fruit) compares well in all respects with typical *L. minimiflorus*, and *White & Gilly 5367* shows the very short, densely sericeous standard which sets off this species from its allies in the Series *Pubiflori*.

LONGHOCARPUS RUGOSUS Benth.

This is the most plentiful of the Middle American *Lonchocarpi*. It is also the most polymorphic of all the species in the genus, not only in shape, size and venation of the leaflets, in vesture and in stipule characteristics but also strikingly so in its pods. Consequently its variations include much greater extremes than those that have been singled out as the bases for most of the recently proposed segregates. On the basis of a single character most of the specimens may be readily assorted into two groups, but the substitution of a second, equally well-marked, characteristic results in a very different composition of the two groups. Furthermore, as soon as a correlation is attempted between two or more of the differentiating features (with the single exception of var. *hintoni*), the number of recalcitrant intermediates becomes disconcerting, as has been pointed out by Standley and Steyermark in their discussion of *L. apricus* (*Fieldiana*, Botany, 24(5): 284. 1946).

Among the most outstanding forms of the species are those characterized by divergence in type of pubescence. A copious, shaggy type of villosity found in combination with very large (9×2.5 cm), few-nerved leaflets and large, widely divaricate, persistent stipules in *Steyermark 45744* from Guatemala is so striking that this plant at first appears to have little in common with *L. rugosus*. This villosity

reappears in a similarly pronounced degree in *Schipp 503* from British Honduras, but is here associated with small, ascending caducous stipules and moderately nerved leaflets of average size (4×2 cm). Between this overdeveloped villosity and the prevalent form with short, only moderately dense villosity, an extensive series of transitional stages is found in innumerable combinations with other characters. In other collections the vesture fluctuates toward either of two additional extremes; a dense tomentum in such individual plants as *Hinton 6325* from Mexico and *Steyermark 51554* from Guatamala, or a comparatively sparse strigosity represented by *Standley 19254* from El Salvador.

A similarly extensive range of fluctuation is evident from a comparison of the legumes, from the standpoint of their shape, size, texture, type of pubescence or number of seeds; of the leaflets, from the standpoint of number, size, texture, venation, or type of apex or base; or of the characteristics of the inflorescence. And in each case a similar lack of consistency, a refusal to submit to the taxonomist's penchant for pigeon-holing, will be noted.

Extensive field acquaintance with *Lonchocarpus rugosus* would doubtless be helpful in suggesting explanations for its seemingly unpredictable behavior. From herbarium evidence alone conjectures are risky, but it seems not altogether improbable that frequently sufficient allowance has not been made for the influence of environmental factors upon the species, since it is not only one of the most widely distributed of the *Lonchocarpi* but is to be found in a greater diversity of habitats than the majority of its congeners.

BOTANY.—*New species of Salix from Szechwan, China.*¹ WEN-PEI FANG, National Szechwan University, Chengtu, Szechwan. (Communicated by EGBERT H. WALKER.)

The four new species of willows described herein were found among the numerous collections that have been made in Szechwan Province, China, in recent years. The types are deposited in the herbarium of the National Szechwan University at Chengtu. Duplicates are being distributed to various herbaria in China and the United States.

¹ Received April 22, 1948.

1. *Salix triandroides* Fang, sp. nov.

Frutex parvus, 2 m altus, cortico laevi, flavescenti- vel fusco-cinereo. Ramuli erecti, cylindrici, hiemales dense nigrescenti- vel fusco-tomentosi, vernaes glabrescentes. Gemmae ovoideae, 8 mm longae, perulis late ovatis extrinsecus dense cinereo-tomentosis. Folia alternata, chartacea, glabra, lanceolata vel oblanceolata, rarius oblongo-ovata vel oblongo-ovata, 3-5 cm, rarius ad 12 cm longa, 1-1.5